The correlation between women's socioeconomic status and self-perceived health

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Abstract

Given increased acknowledgment on a relationship between socioeconomic status and health for women in Korea, this research examined a correlation between women's socioeconomic status and self-perceived health in Korea by utilizing data from A Korean Longitudinal Survey of Women and Family (KLoWF). Survival analysis and Cox regression analysis were used as a statistical method. The results showed that the time required for the perceived health to turn from good to bad was shorter for the low socioeconomic status group compared to the high socioeconomic status group. This suggests that low social groups of women tend to live longer with bad heath conditions than their counterparts.

Keywords: Women's socioeconomic status, Self-perceived health, KLoWF, Survival analysis, Cox regression analysis

1. Introduction

Following the emergence of the perspective viewing health as the product of a social process, a great number of studies have reported on the correlation between health and socioeconomic status. Recent research suggests that individuals with higher socioeconomic status enjoy better health than do their less fortunate peers, thanks to better health-seeking behaviors and greater access to health resources (Kim Min-gyeong et al., 2010). Given the important findings, health equality between different social groups is included as one of the major goals of South Korea's National Health Plan.

With little research having been focused on women in regards to this issue, however, a gender perspective is lacking in the country's planning of public health policies. The reason that studies

have failed to address the gaps in health status within the female population is because most studies set gender as an explanatory variable and then conclude that no difference can be found between men and women if statistical significance is not found in regard to this variable. One recent study[1] on international practices underlined the need to move beyond reproductive health and turn toward socio-environmental factors that may have negative impact on women's health. Theories on women's health concur that differing social positions among women are associated with health inequality (Davidson et al., 2006) and macroscopic socio-environmental changes can affect women's health by transforming individual woman's social location (Arber, 1997). Economic crises are known to bring about a significant level of undesirable social changes, leading to a negative impact on individual citizens' socioeconomic status and consequently on their health. It is reported that the economic polarization and inequality in South Korea has worsened since the foreign currency crisis of 1997. Based on the minimum cost of living, the poverty rate of female senior household heads, which was 36.3% before the crisis, surged to 50.3% in 2000 and had increased to 52.0% by 2009 when a further international financial crisis swept the country (Yeo Yu-jin et al., 2010). Women are more poorly positioned than are men for coping with changes in the labor market resulting from economic crises that trigger increased employment uncertainly, weakening of the male breadwinner model, and a growth in the number of single-member households. Yeo Yu-jin et al. (2010) argues that the fundamental reason underlying women's lack of capacity to respond to changing labor market conditions lies in the combination of their possession of fewer economic resources than did men even before the economic crises together with labor market discrimination. Consequently, under such circumstances women's health is likely to be affected more negatively than is men's.

According to studies on the impact of economic crises on health, the socio-environmental changes brought about by an economic crisis lead to reduced income, which in turn causes socially pathological phenomena such as bankruptcy, credit default, and family dissolution, which then negatively impact mental health, leading to depression and suicidal tendencies (Public Survey a Decade after the Asian Financial Crisis, The Institute for Social Development and Policy Research at Seoul National University, 2007)[2] . According to research using the results of the Korean Labor and Income Panel Survey on the shifting socioeconomic status of female seniors and their health, those who experienced a reduction in income following the first economic crisis[3] were more likely to report a deterioration of their health when compared to those whose income levels remained

1 Quoted from Kim, Young-taek, Jeong Jin-ju, Jeon Hee-jin, Cheon Hee-ran, and Choi Seong-su (2007). Reflections on International Practices for Promoting the Women's Health and Policy Agenda for South Korea.

2 A presentation paper "Shared Growth and South Korea's Middle-class" (2011) requoted; Nam Eun-yeong, Changes in the Middle Class since the Foreign Currency Crisis with a Focus on Consumption and Daily Lives.

3 South Korea was on the brink of national default due to the Asian financial crisis and requested financial support from the IMF on December 3, 1997.

unchanged or grew. Also, the lower their socioeconomic status, the more likely they were to experience worsened health. As to a Cox regression analysis that examined the interaction effect between gender and changes in wage/income following the first economic crisis, senior women in the groups reporting no change or an increase in wage/income were less likely to experience a waning of health than were their peers in the reduced wage/income group; this result was statistically significant (Kim Yeong-taek, 2011).

Despite the clear link between economic crises and health, no research has investigated the relationship between women's socioeconomic status and health before and after the second economic crisis.[4] While the second economic crisis has been touted as a case of successful recovery, it could still have had a negative impact on the socioeconomic status of low-income individuals and thereby on their health. In particular, women who fall into poverty during an economic crisis may later find it more difficult to escape it than do men. According to recent research, even though education and human capital improve, the influence of such variables does not manifest well among the underprivileged, since women in the underprivileged group face worse labor conditions compared to their male counterparts. Also, women with a longer duration of labor market engagement are less likely to overcome poverty than are men in the same situation (Kim Eun-ha, 2009).

Due to the limited availability of longitudinal data, little research has been conducted on women's shifting socioeconomic status and health over the course of time. Instead, the relationship between socioeconomic factors and health at a particular point has been examined using cross-sectional data such as the National Health and Nutrition Examination Survey. This has lowered the statistical reliability of the causal relationship between the two variables. From the life-cycle perspective, an individual's socioeconomic status, although influenced during childhood by that of his/her parents, continues to evolve based on his/her social achievements. Research on the relationship between socioeconomic status and health needs to reflect such changes.

The goal of this research is to analyze the correlation between the changes in women's socioeconomic status and health before and after the second economic crisis (2007-2010).

2. Theoretical review and research models

An individual's socioeconomic status changes over the course of his/her lifecycle. During adolescence, it is affected by parental socioeconomic status. Although lifestyle, personality, and

4 The US-originated financial crisis of 2008 sparked a worldwide economic crisis that included South Korea.

achievement motivation could all be genetically transmitted to some extent, an individual's socioeconomic status is greatly impacted by that of his/her parents. The social resources that can be brought to bear by a person to establish a social status are closely related to his/her parents' socioeconomic status. In this regard, parental socioeconomic status can be a cause of social inequality (Hauser and Warren, 1999).

The theory that parents' social status can be a source of social inequality in their children's generation can be related to health inequality. If parental socioeconomic status can affect children's lifestyle, personality, and achievement motivation, it can also affect their health-seeking behaviors. Major lifestyle factors that can impact children's health behaviors include their parents' diet, hours of sleep, exercise, smoking, and drinking. Children learn or obtain as a habit their parents' health behaviors. It is also reported that low socioeconomic status is associated with undesirable health behaviors such as lack of sleep, unhealthy diet, and obesity (Gazella, 2012).

Their parents' social status influences children's opportunities for education, employment, and income, and eventually results in socio-structural inequality. This inequality can be explained in connection with grown children's socioeconomic status and health-related resources. The education, income, and employment variables which are commonly used to measure socioeconomic status are closely linked to health variables. In terms of education, highly educated people tend to enjoy greater access to information and resources to improve their health compared to the less educated (Ross and Wu, 1995). Income is important as a tool for obtaining health-promoting food, housing, and cultural lifestyles. While the impact of income on health among poor people is greater than among the more affluent, income remains an important factor in the health of low-income but not poor individuals as well. This is because of the fact that while the poverty level of poor people is absolute poverty, that of low-income groups is relative poverty (Backlund et al., 1999). Finally, it has been reported that employment shows a more positive impact on health than does unemployment (Ross and Mirosky, 1995). This may be interpreted in association with healthy workers, but social reputation, qualification, and type of job can all have differing impacts on an individual's health (e.g. mortality) (Gregorio et al., 1997).

Health inequality has been addressed in a number of studies as described above, but few researchers have examined the issue from a gender perspective. Some researchers argue that gender in connection with social environment can serve as a further cause of health inequality and that women are more likely to be subject to health inequality than are men, since their social environments are traditionally inferior to those of men. Moss (2002) and Davidson (2006) explained that a number of socio-environmental variables such as the law, politics, economic development, education, profession, workplace status, and health education affect women more negatively than men and invoke health inequality as a result. Moss attempted to explain women's health through a broader

perspective by including both macroscopic variables such as national history, geographical environment, policy, legal rights, organization, and institution, with microscopic variables such as socio-demographic variables, women's roles in production and reproduction activities, together with well-being-related variables. Next, she examined the interaction effect between the macroscopic and microscopic variables. Such an explanation can be eventually related to a gender-based argument on health inequality. One of the major variables that international researchers use to explain women's health is women's social location. Social location is considered a major source of health inequality between men and women (Kim Young-taek et al., 2007).

In consideration of the discussions above on socioeconomic status (education, income, and job) and health, this paper presents a research model as follows.

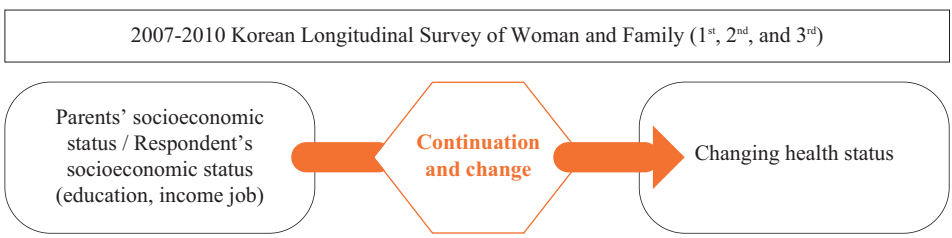

Figure 1. A research model on the changing socioeconomic status and health (2007-2010)

3. Research methods

A. Data and variables

This research used the results of the Korean Longitudinal Survey of Women and Family (KLoWF). The first survey was conducted in 2007, the second in 2008, and the third in 2010.The fourth survey is currently underway. The subjects (original sample households and original qualified household members) of the survey include a total of 9,997 persons aged between 19-64 from 9,068 households selected in a representative nationwide sampling. This survey is valuable for identifying women's social status, economic activities, family structure, and changes. In relation to this research in particular, the survey data enabled the investigation of changes in the socioeconomic status and health of both the subjects and their parents over a period spanning before and after the second economic crisis.

The characteristics of the panel data can be divided into time-invariant variables and time-variant variables.

First, the time-invariant variables include those variables related to parents' socioeconomic status at the time when the subject was approximately 15 years old. The KLoWF contains questions on the place of residence, parents' educational attainment, and family financial status at the time when the survey respondent was 15 years old. These variables are considered time-invariant as they do not change with the passing of time. While place of residence variables are segmented into large city, small- to medium-sized city, rural area (*eup, myeon*), and overseas, the overseas variable was handled as a missing value due to the negligible number of cases. Next, adjustment variables were used considering the differences in medical access and health behaviors by place of residence. As to parents' education, the mother's education was used, taking into account the mother's traditional role of responsibility for the family's health. Instead of using the traditional division of educational attainment (middle school educated or less, high school educated, college educated or higher), this research instead considered the significant proportion of middle school educated or less to create two categories of educational attainment: middle school educated or less and high school educated or higher. Household income at the time when the subject was 15 years old was not included as a survey question due to the potential inaccuracy of the respondents' recall. Instead, respondents were asked about the self-rated financial status of their family at that time based on their parents' jobs and income level. Responses were then categorized into three groups: very affluent or relatively affluent; average; and relatively poor or very poor.

Table 1. Demographic characteristics of respondents at 15 years of age (2007 survey)

(Unit: 1,000 persons; %)

Category	Frequency	%
Place of residence		
Large city	2,787	28.1
Small- and medium-sized city	1,748	17.6
Rural area (eup, myeon)	5,384	54.3
Mother's educational attainment		
No education, elementary school, middle school	8,056	82.9
High school, college, university, graduate school	1,659	17.1
Financial status		
Very affluent, relatively affluent	1,897	19.0
Average	4,553	45.4
Relatively poor, very poor	3,562	35.6

Note: Numbers may not sum to total due to missing values.

Time-variant variables include age, education, income, and profession. Age, which spans 18 to 64 years of age as of 2007, changed over the course of the first to third surveys. Given the distribution and relevant implications, educational attainment was separated into middle school educated or less, high school educated, and college educated or higher. Income was divided into bands of 25 percentile ranks using household income variables from the three surveys. Profession was first categorized into employed and not employed. The not employed group consists of those with no job, students, and those in military service. The employed group was separated into four categories: managers, professionals, and office workers; service and sales workers; workers in agriculture/forestry/fishery; and mechanics and manual laborers.

Table 2. Respondents' educational attainment and professions (2007, 2008, 2010)

(Unit: 1,000 persons; %)

Category	1st (2007)	2nd (2008)	3rd (2010)
Education			
Middle school educated or less	2,805 (28.1)	2,805 (28.1)	2,466 (30.8)
High school educated	3,725 (37.3)	3,725 (37.3)	2,853 (35.7)
College educated or higher	3,463 (34.7)	3,463 (34.7)	2,680 (33.5)
Profession			
Managers/professionals/office workers	1,291 (13.0)	1,291 (13.0)	1,267 (15.9)
Service and sales workers	1,363 (13.3)	1,363 (13.3)	1,304 (16.3)
Workers in agriculture/forestry/fishery	831 (8.3)	831 (8.3)	786 (9.8)
Mechanics and manual laborers	757 (7.4)	757 (7.4)	789 (7.7)
Other (unemployed/students/mandatory military service)	5,712 (57.4)	5,712 (57.4)	3,837 (48.1)

Note: 1) Numbers may not sum to total due to missing values.
2) Age was exempted here due to its continuous nature and income was also not presented for its obvious division.

In terms of health-related variables, which are all time-variant dependent variables, questions on perceived health status are widely considered to be highly associated with objective health status and are also conventionally used in health-related questionnaires for their convenience and cost effectiveness. Recent research has found the chronic illness prevalence effect to be higher than simple report-rate effect[5] regarding the reason for women's perceived health to be worse than that among men, implying a relation between women's self-rated health and objective health status (Kim Seung-gon, 2009). This research tracked changes in self-rated health based on the responses to 5-point scale questions featured in the first, second, and third KLoWFs. While the survey divided the

5 Report-rate effect refers to the effect of reporting bad health status without the presence of objective illness.

responses into five categories of very good, good, average, bad, and very bad, this research dichotomized them between good (very good, good, average) and bad (bad, very bad).

73.2% of respondents reported good health in all three surveys, while 26.8% reported changes in perceived health. 5.9% rated their health to be bad in the first survey, good in the second survey, and good in the third survey; 5.6% bad in all the three surveys; 4.7% good in the first survey, bad in the second survey, and good in the third survey; 3.5% good in the first two surveys and bad in the third survey; 2.0% good in the first survey, bad in the second survey, and bad in the third survey; and 2.0% bad in the first survey, good in the second survey, and bad in the third survey.

Table 3. Dichotomized distribution of self-rated health

(Unit: 1,000 persons; %)

First survey (2007)	Second survey (2008)	Third survey (2010)	First survey (2007)
good	good	good	5,435 (73.2)
good	good	bad	262 (3.5)
good	bad	bad	152 (2.0)
good	bad	good	348 (4.7)
bad	good	good	436 (5.9)
bad	bad	good	223 (3.0)
bad	good	bad	149 (2.0)
bad	bad	bad	417 (5.6)

B. Analysis methods[6]

In the survival analysis performed in this research, an event was defined if the self-rated health changes from very good, good, or average to bad or very bad. The person-level data sets of the 2007, 2008, and 2010 surveys were converted into person-period data sets listing a respondent's experiential growth or changes in a longitudinal direction. This conversion of data structure facilitates the measurement of the changes of events in panel data (Singer and Willett, 2003).

Kaplan-Meier analysis and Cox regression analysis were used for analysis. Kaplan-Meier analysis, which is considered a technical analysis for investigating panel data, is useful in demonstrating a univariate variable's probability of an event. It is similar to a life table featuring a concept of conditional probability. The basis of Kaplan-Meier analysis is defined by the number

6 Kim Yeong-taek, Kim Dong-sik, and Kim Su-yeon (2010). Changes among the Underprivileged Caused by Economic Crisis, Evaluation of Social Security Net, and Future Measures: a Gender-based Human New Deal (Health), p. 70-71.

of events, the time j in which an event begins, and the number of subjects at risk. It can be represented as the following equation (Singer and Willett, 2003).

$$p(t_j) = \frac{n\ events_j}{n\ at\ risk_j}$$

The survival function of $S(t_j)$, which is the survival probability that passes through the jth period, is defined by multiplying the sequential survival probability of each period from the first to the jth period. This can be represented as the following equation.

$$S(t_j) = (1 - p(t_1))(1 - p(t_2)) \cdots (1 - p(t_j))$$

Unlike Kaplan-Meier analysis, Cox regression analysis enables a multivariate analysis with predictors correcting one another. In this research, a Cox regression analysis was used to examine the probability ratios of predictors changing good health (very good, good, average) to bad health. The Cox regression analysis assumes that the influences of predictors remain constant throughout the period from 2007 to 2010 and risk probabilities within predictor groups are similar (Singer and Willett, 2003). These assumptions were verified in the survival probability histogram of the Kaplan-Meier analysis. The Cox regression analysis complying with those assumptions is called a proportional hazard model. This can be expressed as the following equation (Singer and Willett, 2003).

$$hi(t) = [h0(t)]eb0 + b1\xi 1 + ... + bpxip$$

hi (t): the hazard rate that occurs at the ith time along the time *t*
h0 (t): the first hazard rate along the time *t*
p: the number of covariates
bj: the value of the jth regression coefficient
xij: the value of the ith case of jth covariates

4. Results

A survival analysis was performed in order to determine the probability ratios of a change from good health (very good, good, average) to bad health (bad and very bad) by predictor group selected for the period of 2007-2010 through a Kaplan-Meier analysis. The order of surveys was used as time variables (first survey=1; second survey=2; third survey=3), and age variable was considered a controlling variable. The average estimated values of the three surveys were obtained for each predictor group with upper and lower limits at the 95% confidence interval. The survival function for each predictor group is presented in a diagram below.

When it comes to the place of residence at 15 years of age, the average value for large city was 2.873, the lower limit 2.862, and the upper limit 2.883. The values were 2.858, 2.845, and 2.870, respectively, for small- to medium-sized city and 2.746, 2.736, and 2.757 for eup and myeon rural areas. This can be interpreted as the lower the population of the place of residence, the sooner the transition from good health to bad health occurs.

Table 4. Survival analysis by place of residence at 15 years of age

(Unit: number of cases)

Category	Sum N	No. of cases	Average			
			Estimated value	Standard error	95% confidence interval	
					Lower limit	Upper limit
Large city	7,703	688	2.873	.005	2.862	2.883
Small- to medium-sized city	5,750	613	2.858	.006	2.845	2.870
Eup and myeon rural areas	12,598	2,517	2.746	.006	2.736	2.757

Against the cumulative survival rate ranging from 0 to 1, the survival probability (good to bad health) decreases over time (the order of survey). The smaller the population of an area, the lower the survival probability becomes. A censoring case in a survival analysis means that there is no relevant data or good-turned-bad health event.

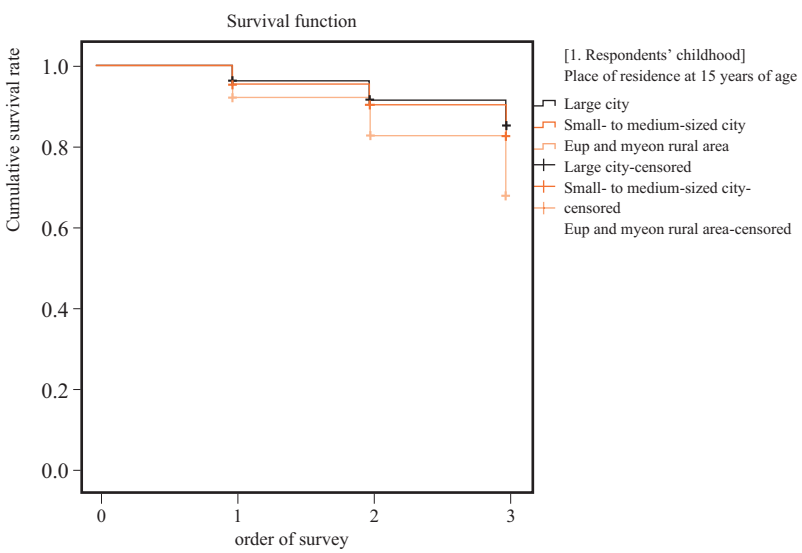

Figure 2. Survival function by place of residence at 15 years of age

Regarding the mother's educational attainment at the time the respondent was 15 years old, the average survival value, the lower limit, and the upper limit were 2.790, 2.782, 2.798, respectively, for middle school educated or lower and 2.932, 2.922, and 2.943, respectively, for high school educated or higher. In other words, the lower the mother's educational attainment, the sooner the transition from good health to bad health occurs.

Table 5. 15 Survival analysis by the mother's educational attainment at the time when the respondent was 15 years of age

(Unit: number of cases)

Category	Sum N	No. of cases	Average			
			Estimated value	Standard error	95% confidence interval	
					Lower limit	Upper limit
Middle school educated or lower	21,355	3,431	2.790	.004	2.782	2.798
High school educated or higher	4,031	193	2.932	.005	2.922	2.943

The survival probability decreases over time and it goes down apace with the mother's lower educational attainment.

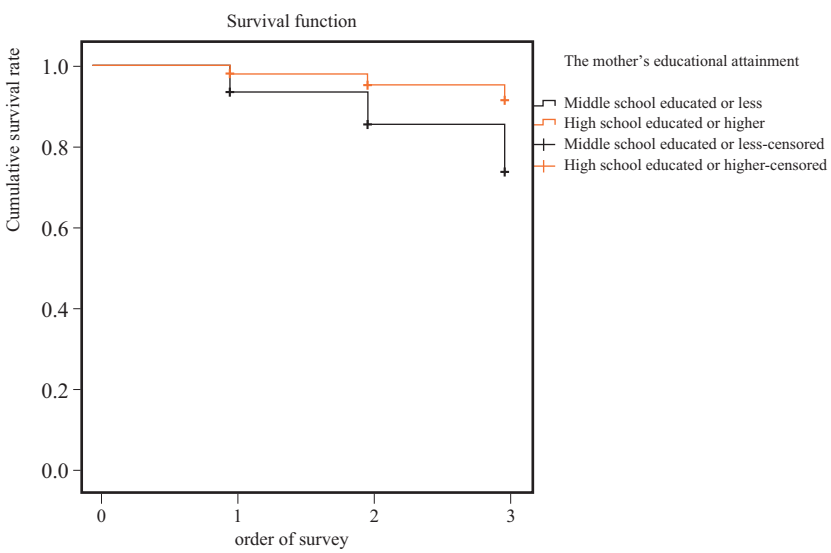

Figure 3. Survival function by the mother's educational attainment at 15 years of age

Table 6. Survival analysis by family financial status at 15 years of age

(Unit: number of cases)

Category	Sum N	No. of cases	Average			
			Estimated value	Standard error	95% confidence interval	
					Lower limit	Upper limit
Affluent	4,927	669	2.815	.008	2.799	2.830
Average	11,708	1,066	2.879	.004	2.870	2.887
Poor	9,408	2,090	2.718	.007	2.705	2.731

The worse the financial status, the lower the survival probability becomes.

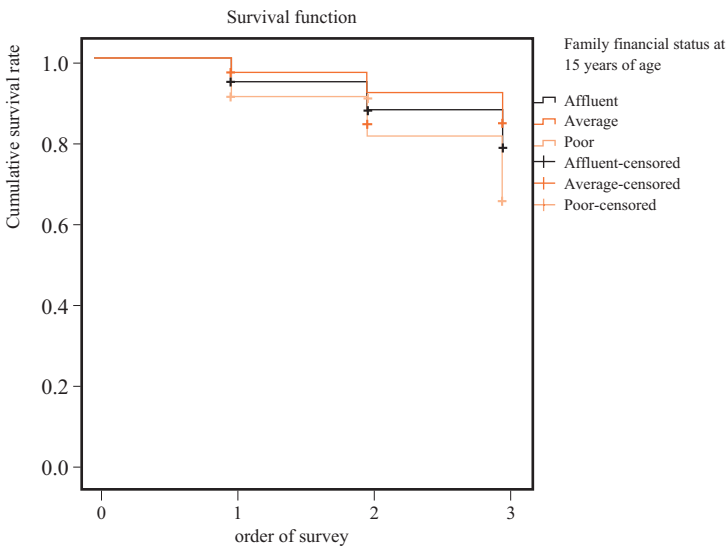

Figure 4. Survival function by family financial status at 15 years of age

As to a respondent's educational attainment, the average value, the lower limit, and the upper limit were 2.595, 2.578, and 2.611, respectively, for the middle school educated or lower; 2.879, 2.859, and 2.878 for the high school educated; and 2.943, 2.937, and 2.950 for the college educated or higher. This implies that the lower the educational attainment may be, the sooner health shifts to the worse.

Table 7. Survival analysis by respondent's educational attainment

(Unit: number of cases)

Category	Sum N	No. of cases	Average			
			Estimated value	Standard error	95% confidence interval	
					Lower limit	Upper limit
Middle school educated or lower	7,767	2,567	2.595	.008	2.578	2.611
High school educated	11,708	1,066	2.879	.005	2.859	2.878
College educated or higher	9,408	2,090	2.943	.003	2.937	2.950

When the respondent's education is low, their survival probability is low as well.

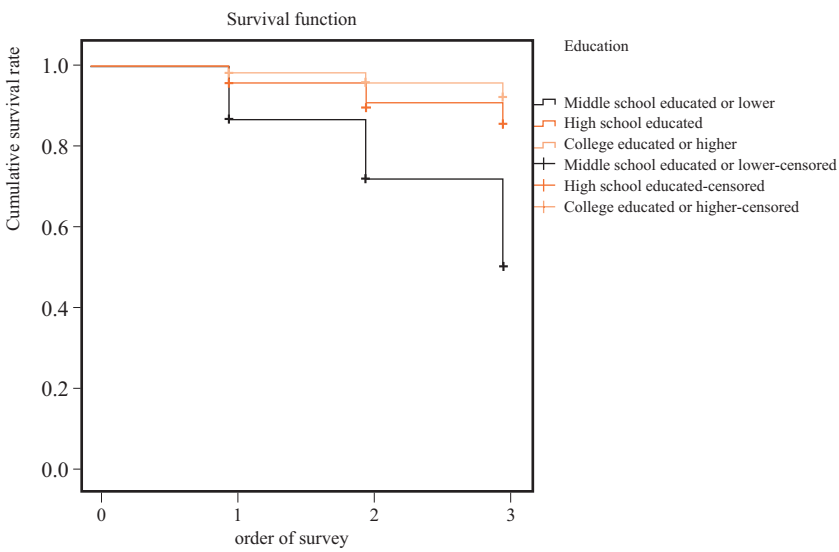

Figure 5. Survival function by respondent's education

When it comes to a respondent's total household income, which was categorized into bands of 25 percentile rank, the average value, the lower limit, and the upper limit were 2.622, 2.605, and 2.639, respectively, for the first (lowest) household income rank; 2.842, 2.830, and 2.855 for the second rank; 2.905, 2.895, and 2.915 for the third rank; and 2.909, 2.899, and 2.918 for the fourth (richest) rank. The lower the household income, the sooner occurs the transition from good to bad health.

Table 8. Survival analysis by respondent's household income

(Unit: number of cases)

Category	Sum N	No. of cases	Average			
			Estimated value	Standard error	95% confidence interval	
					Lower limit	Upper limit
1st 25th	7,040	2,133	2.622	.009	2.605	2.639
2nd 25th	6,539	757	2.842	.006	2.830	2.855
3rd 25th	5,925	450	2.905	.005	2.895	2.915
4th 25th	6,147	401	2.909	.005	2.899	2.918

The lower the household income, the lower is the survival probability.

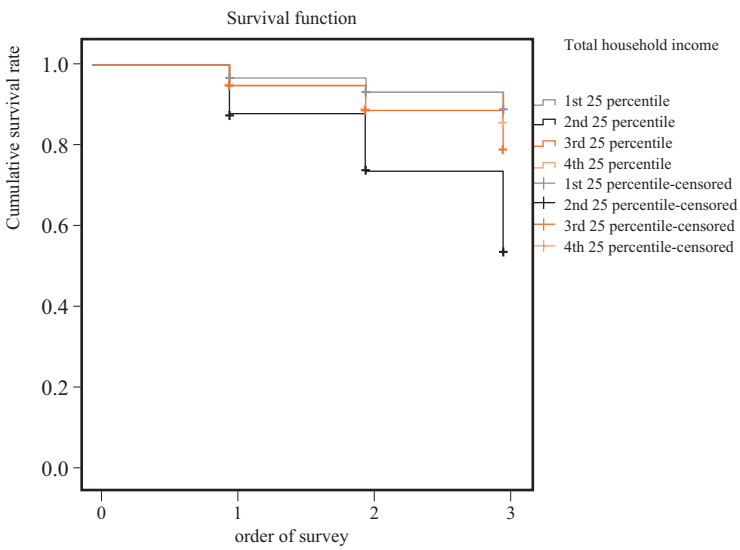

Figure 6. Survival function by total household income

As to the respondent's profession, the average value, the lower limit, and the upper limit were 2.959, 2.950, and 2.968, respectively, for managers/professionals/office workers; 2.859, 2.844, and 2.874 for service and sales workers; 2.664, 2.636, and 2.691 for workers in agriculture/forestry/fishery; 2.806, 2.784, and 2.829 for mechanics and manual laborers; and 2.781, 2.771, and 2.791 for other (unemployed/students/military service personnel). The time required for good health to turn bad was shortest among workers in the agriculture/forestry/fishery category, followed by other, mechanics and manual laborers, service and sales workers, and managers/professionals/office workers.

Table 9. Survival analysis by respondent's profession

(Unit: number of cases)

Category	Sum N	No. of cases	Average			
			Estimated value	Standard error	95% confidence interval	
					Lower limit	Upper limit
Managers/professionals/office workers	3,734	115	2.959	.004	2.950	2.968
Service and sales workers	3,809	411	2.859	.008	2.844	2.874
Workers in agriculture/forestry/fishery	2,411	710	2.664	.014	2.636	2.691
Mechanics and manual laborers	2,261	354	2.806	.012	2.784	2.829
Other (unemployed/students/military service personnel)	13,949	2,242	2.781	.005	2.771	2.791

It was lowest among workers in agriculture/forestry/fishery, followed by other, mechanics and manual laborers, service and sales workers, and managers/professionals/office workers.

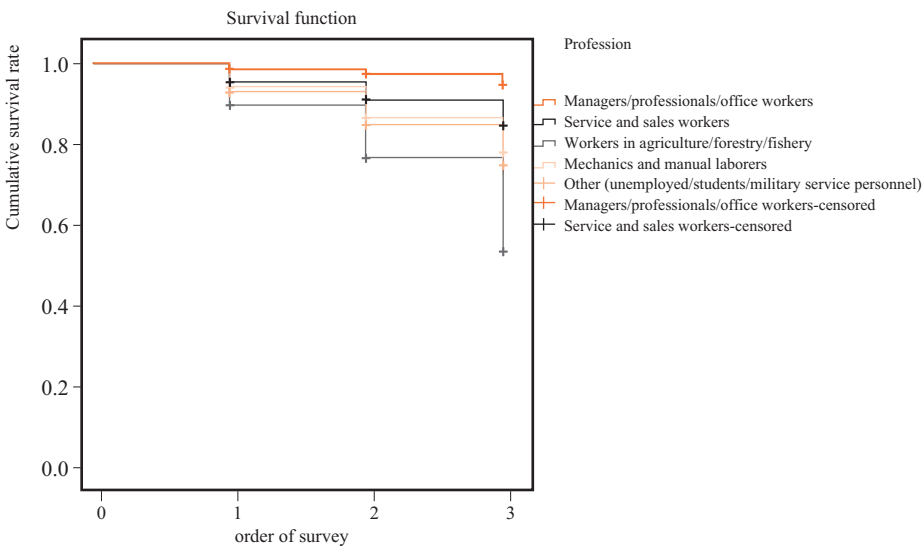

Figure 7. Survival function by respondent's profession

Next, a multivariate analysis was conducted through a Cox regression analysis. In Model 1, age was corrected and the characteristics of respondents at the time when they were 15 years old and the probability ratio of self-rated health turning from good to bad were measured. In Model II, the probability ratio was determined by further including the variables of the respondent's education, income, and profession.

In Model I, the probability ratio of perceived health turning bad over time was low (Exp (B)=1.063, p<.000). In terms of the place of residence at 15 years of age, the probability ratio was lower among those who lived in small- to medium-sized cities and large cities compared to those who lived in rural areas (Exp (B)=.871, p<.000; Exp (B)=.883, p<.000). As to the mother's educational attainment, the probability ratio was lower among the high school educated or higher than among the middle school educated or lower (Exp (B)=.776, p<.000). Regarding family financial status at 15 years of age, the probability ratio was lower among average families than among affluent families (Exp (B)=.816, p<.000). However, the ratio was higher among poor families than among affluent families (Exp (B)=1.286, p<.000).

In Model II which further included the respondent's education, household income, and profession variables, the relationships between the probability ratios of all the characteristics of respondents at the time when the respondents were 15 years old were not statistically significant, excepting that the probability ratio of the group with average family financial status was lower with statistical significance than that of the affluent group.

In Model II, the probability ratios of the middle school educated or lower and high school educated were higher than that of the college educated or higher (Exp (B)=2.921, p<.000; Exp (B)=1.526, p<.000). Compared to the highest household income group, both the lowest household income group and second lowest household income group showed higher probability ratios of perceived health turning good to bad (Exp (B)=1.981, p<.000; Exp (B)=1.302, p<.000). As to the respondent's profession, the probability ratios of workers in agriculture/forestry/fishery and other (unemployed/students/military service personnel) were higher than that of managers/professionals/office workers (Exp (B)=1.529, p<.000; Exp (B)=2.082, p<.000).

Table 10. Results of a Cox regression analysis on the relationship between socioeconomic status and perceived health

Variable	Model Ⅰ		Model Ⅱ	
	ExP (B)	B (SD)	ExP (B)	B (SD)
Age	1.063***	.061 (.002)	1.024***	.024 (.002)
Place of residence at 15 years of age				
Large city	.871***	-.138 (.048)	1.016	.016 (.050)
Small- to medium-sized city (*Eup* and *myeon* rural areas)	.883***	-.124 (.048)	.959	-.042 (.048)

Variable	Model Ⅰ		Model Ⅱ	
Mother's education at 15 years of age				
High school educated or higher	.776***	-.254 (.081)	.898	-.107 (.084)
(Middle school educated or lower)				
Family financial status at 15 years of age				
Average	.816***	-.203 (.051)	.768***	-.264 (.051)
Poor (Affluent)	1.286***	0.251 (.047)	1.044	.043 (.048)
Respondent's education				
Middle school educated or lower			2.921***	1.072 (.082)
High school educated (College educated or higher)			1.526***	.423 (.070)
Respondent's household income				
1st 25th			1.981***	.684 (.060)
2nd 25th			1.302***	.264 (.065)
3rd 25th			.969	-.032 (.071)
(4th 25th)				
Respondent's profession				
Service/sales			1.224	.202 (.115)
Agriculture/forestry/fishery			1.529***	.425 (.113)
Mechanics/manual labor			1.197	.180 (.118)
Other (unemployed/students/military service)			2.082***	.733 (.104)
(Managers/professionals/office workers)				
Chi-Square	2136.797		3281.796	
-2LL	65577.060		64761.961	

Note: P<.05 -*, p<.01-**, p<.000-***; ( ) - benchmark

5. Conclusions

This research used the KLoWF data to perform a survival analysis designed to identify the relationship between socioeconomic status and perceived health among women. Socioeconomic status is commonly used as a measure of social inequality. The correlation between social inequality stemming from differences in socioeconomic status and health inequality was verified. As was done in a recent study[7] that used the Korean Labor and Income Panel Survey

7 Kim Young-taek et al. (2011). Female Seniors' Health and Policy Measures in the Era of Centenarians, Korean Women's Development Institute Report

data to demonstrate a link between the two variables, it was similarly proven in this research using the KLoWF data.

The analysis examining the socioeconomic status of KLoWF respondents and that of their parents at the time when the respondents were 15 years of age verified that lower socioeconomic status is associated with a higher probability ratio for perceived health to deteriorate. It is noteworthy that the time required for perceived health to worsen among the low socioeconomic status group was shorter than the time reported by the high socioeconomic status group, since the likelihood of bad health turning to good reduces with age. Although perceived health was examined over a relatively short period of time in this research, the proportion of those whose health turned from bad to good was below ten percent.

According to the results of the multivariate analysis in this research, the probability ratio of perceived health turning from good to bad was high compared to reference groups when the women were unemployed or students[8], workers in agriculture/forestry/fishery, less educated, and earned less income (the variables were corrected). Given that the three surveys were conducted over a period spanning from immediately before to after the second economic crisis, the country's economic situation is believed to have negatively affected women's health. Due to the limitations of the data and lack of questions related to the economic crisis in the surveys, direct comparison and verification of the impact of the economic crisis were unfeasible. However, one recent study has verified the correlation between changed socioeconomic status and perceived health after the first economic crisis (Kim Young-taek, 2010). Over the 2007-2010 period examined in this research, 73.2% of women reported continuously good health and 26.8% experienced changes in their perceived health. Among those who reported changed health status, some would have experienced deterioration in their health resulting from an altered financial status triggered by the economic crisis.

In this regard, it appears necessary for the government to provide more proactive support for those with low socioeconomic status. In response to a social crisis, the government's current emergency assistance system primarily offers livelihood support, housing support, and welfare facility-based support for one month and for up to six months when deemed necessary by the emergency assistance deliberation committee. As to medical assistance, which requires continuous follow-up and treatment, assistance is provided just once and then again when the case is determined to be an ongoing crisis situation. When the close correlation between socioeconomic status and health demonstrated in this research is taken into account, however, medical support

8 Although "other" includes the unemployed, students, and military service personnel, military service personnel was excluded from statistical interpretation because there was only one person who marked military service.

needs to be provided over an extended period on a continual basis similarly to the provision of welfare support (Kim Yeong-taek et al., 2010).[9]

Although there is a high correlation between perceived health and objective health, it would be desirable for future research to compare the two variables, especially in terms of mental health aspects such as depression, the rate of which reported by women is double that of men. Unlike the three previous KLoWF surveys, which included a limited number of health-related questions, the fourth survey features a significant number of additional questions regarding health and will provide data to enable a more accurate analysis of social environments and women's health.

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